

IN THE DRAWINGS

Annotated Sheets Showing Changes with respect to Figure 10D, 10E, and 12E of the drawings is provided with proposed change indicated in red ink. Corresponding Replacement Sheets are also enclosed. Applicants submit that the drawing as amended does not add new matter given that support is found in the originally filed drawings and in the specification at page 35, lines 1-5.

REMARKS

Reconsideration of the application as amended is respectfully requested.

Claims 47-83 and 116-119 stand rejected. The reference by applicants to claims 116-119 in the Preliminary Amendment filed January 27, 2004 was an error in claim numbering given that the parent application only has 83 claims.

Applicants filed a Corrected Preliminary Amendment on June 22, 2005 that added new claims 84-87 rather than claims 116-119. Apparently that Corrected Preliminary Amendment did not reach the Examiner before the present Office Action was mailed. Applicants in this amendment have canceled claims 84-119. Therefore, the claim numbering issue has been corrected.

Claims 47-51, 56-58, 60, 61, 75, and 79 stand rejected under 35 U.S.C. § 102(a) as being anticipated by published PCT Application No. WO 99/36948 of Adams et al. ("Adams").

Claims 47-51, 56-58, 60, 61, 75, and 77-79 stand rejected under U.S.C § 102(e) as being anticipated by U.S. Patent No. 6,074,890 of Yao et al. ("Yao").

Claims 52, 53, 62, 63, 80, and 81 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Adams in view of U.S. Patent No. 5,719,073 of Shaw et al. ("Shaw").

Claims 54, 55, 64, 65, 82, and 83 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Adams in view of U.S. Patent No. 5,591,679 of Jakobsen et al. ("Jakobsen").

Claims 52, 53, 62, 63, 66-72, 80, 81, and 119 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of Shaw.

Claims 55, 65, and 83 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of Jakobsen.

Claim 59 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of U.S. Patent No. 6,030,887 of Desai et al. ("Desai").

Claims 74 and 118 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of Shaw and in further view of Jakobsen.

Claims 54, 64, and 82 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of Shaw and in view of U.S. Patent No. 6,428,713 of Christenson et al. ("Christenson").

Claims 73 and 116 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of Shaw in view of Christenson.

Claim 117 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of Shaw and Desai and in further view of Christenson.

Claims 48, 54, 60, 64, 67, 73-74, 76, 82, 84-87, 88-115 and 116-119 have been canceled. Claims 47, 56, 59, 66, 69, 72, and 75 have been amended. Support for the amendments is found in the specification at pages 26-39 and in Figures 8, 9A-9k, 10A-10E, 11, and 12A-12E of the drawings. It is respectfully submitted that the amendments do not add new matter.

Applicants reserve all rights with respect to the applicability of the doctrine of equivalents.

Figures 10D, 10E, and 12E have been amended to conform the formal drawings to the originally-filed drawings. Support for the corrections is found in originally filed Figures 10D, 10E, and 12E of the drawings.

The specification has been amended at page 35, line 3 to correct the reference numerals. Support is found in the originally-filed Figure 9K and in the specification at page 33, lines 3-4, and page 35, lines 3-5. It is submitted that the amendment of the specification does not add new matter.

The Examiner has rejected claim 47 under 35 U.S.C. § 102(a) in view of Adams and under 35 U.S.C. § 102(e) in view of Yao.

Claim 47 has been amended.

Applicants respectfully submit that amended claim 47 is not anticipated under 35 U.S.C. § 102(a) by Adams and not anticipated under 35 U.S.C. § 102(e) by Yao.

Amended claim 47 includes the following limitations:

deeply etching the second side of the substrate to form narrow blades;

coupling a base wafer to the second side of the substrate;

etching to release the structures and to provide electrical isolation, wherein at least one of the narrow blades is isolated by one of the vertical isolation trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

(Amended claim 47).

In contrast, Adams does not disclose the formation of narrow blades. Instead, Adams discloses a “large area block or platform.” (Adams p. 17, line 23). Adams does not disclose coupling a base wafer to the second side of the substrate. Adams also does not disclose etching to release the structures and to provide electrical isolation, wherein at least one of the narrow blades is isolated by one of the vertical isolation trenches, and wherein at least one of the narrow blades is coupled to one of the structures. Adams does not disclose narrow blades. Moreover, Adams discloses that

one of the end results is the formation of “cantilever beams 102 and 104 which are joined together at one end.” (Adams p. 19, lines 4-5). Thus, Adams does not disclose at least one narrow blade isolated by a vertical isolation trench.

In contrast to amended claim 47, Yao does not disclose forming narrow blades. Yao does not disclose coupling a base wafer to the second side of the substrate. Yao also does not disclose etching to release the structures and to provide electrical isolation, wherein at least one of the narrow blades is isolated by one of the vertical isolation trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

Therefore, applicants respectfully submit that amended claim 47 is not anticipated by Adams under 35 U.S.C. § 102(a) or by Yao under 35 U.S.C. § 102(e).

Given that claims 49-53 and 55 depend direct or indirectly with respect to amended claim 47 and add further limitations, applicants respectfully submit that claims 49-53 and 55 are allowable over the prior art cited by the Examiner.

The Examiner has rejected claim 56 under 35 U.S.C. § 102(a) in view of Adams and under 35 U.S.C. § 102(e) in view of Yao.

Claim 56 has been amended.

Applicants respectfully submit that amended claim 56 is not anticipated under 35 U.S.C. § 102(a) by Adams and not anticipated under 35 U.S.C. § 102(e) by Yao.

Amended claim 56 includes the following limitations:

- deeply etching the second side of the substrate to form narrow blades;
- fusion bonding a recessed base wafer to the second side of the substrate;
- forming on the first side of the substrate vertical trenches containing dielectric material;

...
etching to release the structures, wherein at least one of the narrow blades resides between two of the vertical trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

(Amended claim 56)

In contrast, Adams does not disclose the formation of narrow blades. Instead, Adams discloses a “large area block or platform.” (Adams p. 17, line 23). Adams does not disclose fusing bonding a recessed base wafer to the second side of the substrate. Adams does not disclose etching to release the structures, wherein at least one of the narrow blades reside between two of the vertical trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

In contrast to amended claim 56, Yao does not disclose the formation of narrow blades. Yao does not disclose fusion bonding a recessed base wafer to the second side of the substrate. Yao does not disclose etching to release the structures, wherein at least one of the narrow blades resides between two of the vertical trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

Therefore, applicants respectfully submit that amended claim 56 is not anticipated by Adams under 35 U.S.C. § 102(a) or by Yao under 35 U.S.C. § 102(e).

Given that claims 57-58, amended claim 59, claims 61-63, and previously amended claim 65 depend directly or indirectly with respect to amended claim 56 and add further limitations, applicants respectfully submit that claims 57-58, 59, 61-63, and 65 are allowable over the prior art cited by the Examiner.

The Examiner has rejected claim 66 under 35 U.S.C. § 103(a) as being unpatentable over Yao in view of Shaw.

Claim 66 has been amended.

Applicants respectfully submit that amended claim 66 is not unpatentable under 35 U.S.C. § 103(a) over Yao in view of Shaw.

Amended claim 66 includes the following limitations:

deeply etching the second side of the SOI substrate to form narrow blades, wherein at least one narrow blade is coupled to one of the structures and wherein at least one narrow blade resides beneath at least one via;

coupling a base wafer to the second side of the SOI substrate;

(Amended claim 66).

Applicants submit that Yao does not teach or suggest a combination with Shaw and that Shaw does not teach or suggest a combination with Yao. It would be impermissible hindsight, based on applicants' own disclosure, to combine Yao with Shaw.

Even if Yao and Shaw were combined, such a combination would lack the operation of deeply etching the second side of the SOI substrate to form narrow blades, wherein at least one narrow blade is coupled to one of the structures and wherein at least one narrow blade resides beneath at least one via. Moreover, such a combination would also lack the operation of coupling a base wafer to the second side of the SOI substrate.

Therefore, it is respectfully submitted that amended claim 66 is not unpatentable under 35 U.S.C. § 103(a) over Yao in view of Shaw.

Given that claim 68, amended claim 69, claim 71, and amended claim 72 depend from claim 66 and add additional limitations, applicants respectfully submit that claims 68-69 and 71-72 are allowable over the prior art cited by the Examiner.

The Examiner has rejected claim 75 under 35 U.S.C. § 102(a) as being anticipated by Adams and under 35 U.S.C. § 102(e) as being anticipated by Yao.

Claim 75 has been amended.

Applicants respectfully submit that amended claim 75 is anticipated under 35 U.S.C. § 102(a) by Adams and not anticipated under 35 U.S.C. § 102(e) by Yao.

Amended claim 75 includes the following limitations:

attaching a spacer substrate to the second side of the substrate resulting in cavities;

...
etching an opening through the spacer substrate to expose the masking layer on the second side of the substrate;

deeply etching the second side of the substrate to form narrow blades;

coupling a base wafer to the spacer substrate;
etching to release the structures, wherein at least one of the narrow blades resides between two of the vertical trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

(Amended claim 75).

In contrast, Adams does not disclose attaching a spacer substrate to the second side of the substrate resulting in cavities. Applicants respectfully submit that the photoresist layer 80 of Adams is not a spacer substrate. Moreover, there are not cavities under the photoresist layer 80 of Adams. Given that Adams does not disclose a spacer substrate, Adams also does not disclose etching an opening through the spacer substrate to expose the masking layer on the second side of the substrate.

Adams does not disclose forming narrow blades, as discussed above. Adams does not disclose coupling a base wafer to the spacer substrate. Adams does not disclose etching to release the structures, wherein at least one of the narrow blades resides between two of the vertical trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

Also in contrast to amended claim 75, Yao does not disclose attaching a spacer substrate to the second side of the substrate resulting in cavities. Applicants respectfully submit that a fourth mask is not a spacer substrate. Moreover, there are not cavities under the fourth mask of Yao. Given that Yao does not disclose a spacer substrate, Yao does not disclose etching an opening through the spacer substrate to expose the masking layer on the second side of the substrate. Yao does not disclose forming narrow blades. Yao does not disclose coupling a base wafer to the spacer substrate. Yao does not disclose etching to release the structures, wherein at least one of the narrow blades resides between two of the vertical trenches, and wherein at least one of the narrow blades is coupled to one of the structures.

Therefore applicants respectfully submit that amended claim 75 is not anticipated by Adams under 35 U.S.C. § 102(a) and not anticipated by Yao under U.S.C. § 102(e).

Given that claims 77-81 and 83 are dependent claims that depend directly or indirectly from amended claim 75 and add further limitations, applicants respectfully submit that claims 77-81 and 83 are patentable over the prior art cited by the Examiner.

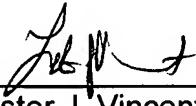
Applicants therefore respectfully submit that the rejections set forth in the Office Action have been overcome.

If there are any charges not covered by any check submitted, please charge
Deposit Account No. 02-2666.

Respectfully submitted,

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Annotated Sheet

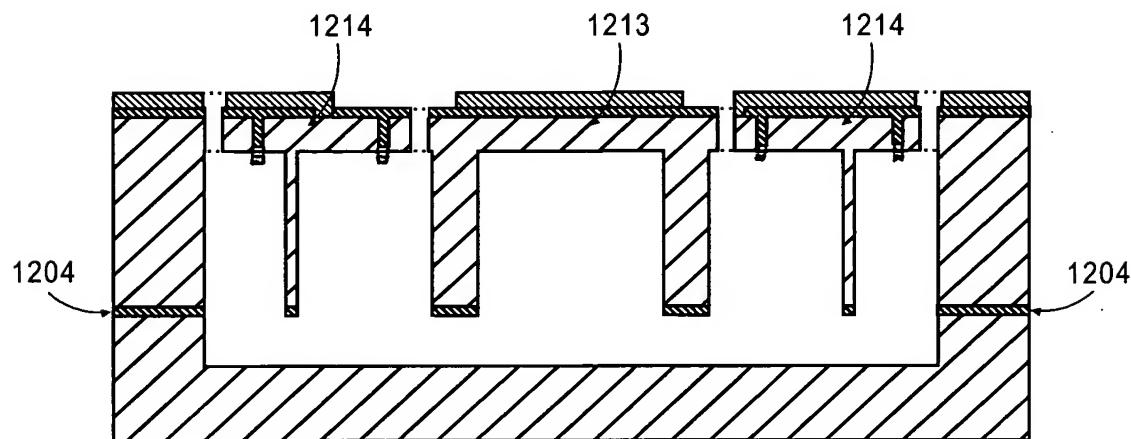


FIG. 10D

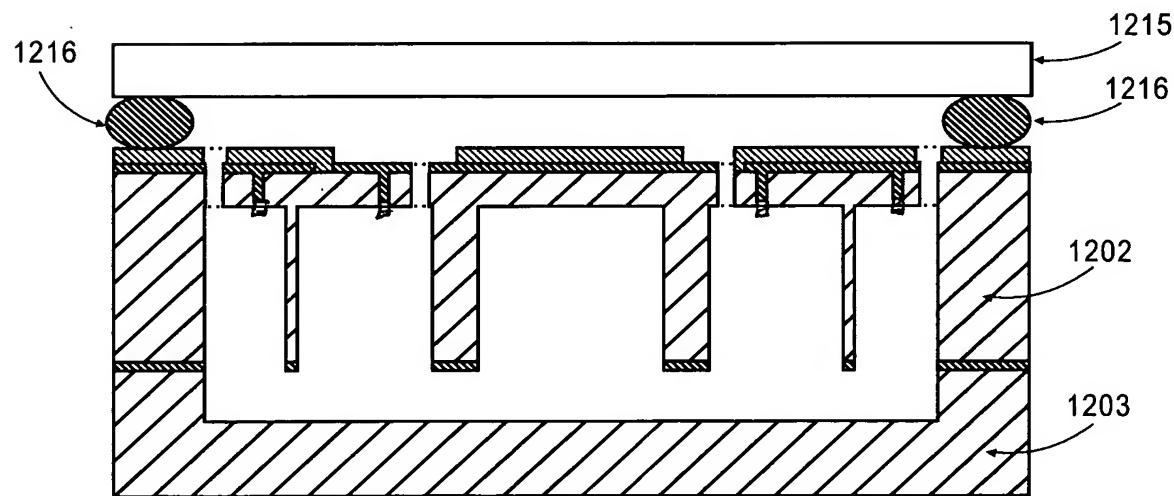


FIG. 10E

Annotated Sheet

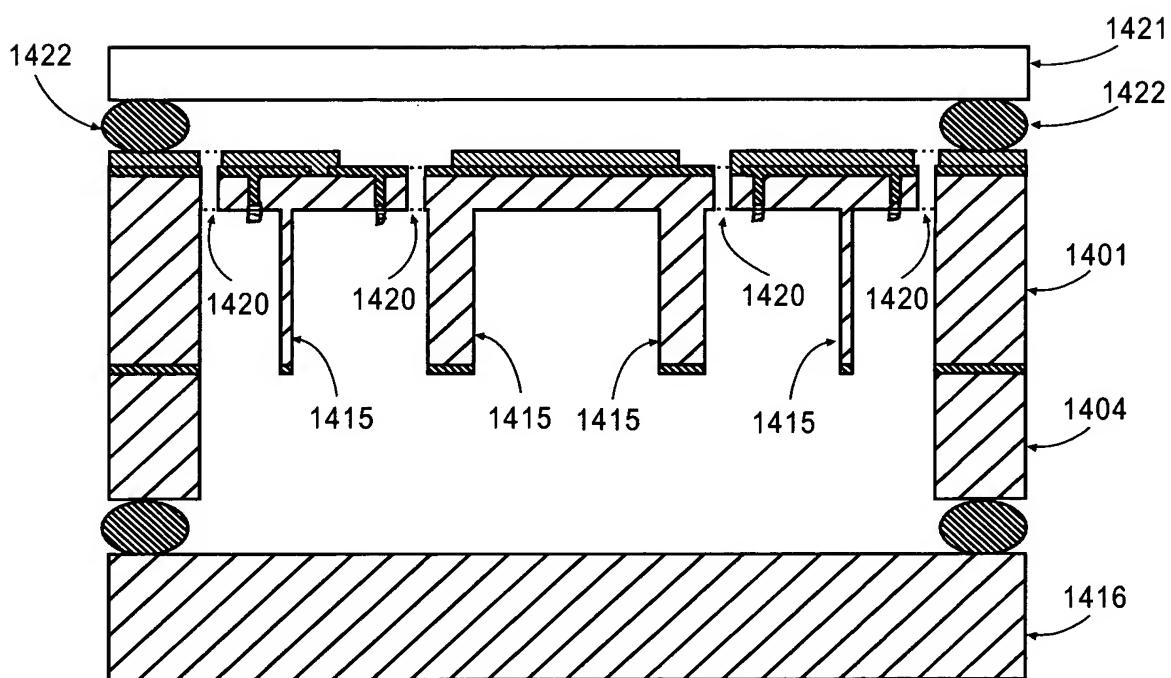


FIG. 12E